IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Appellant:	Tokkonen et al.	Examiner:	Daglawi, A.
Serial No.:	10/591,762	Group Art Unit:	2618
Filing Date:	September 1, 2006	Docket No.:	IHN.065.WUS
Confirmation No.:	7880	Customer No.:	76385
Title:	ACTUATING FUNCTIONALITY IN ELECTRONIC DEVICE		

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this paper is being electronically transmitted by EFS-WEB to the United States Patent and Trademark Office on September 22, 2009.

By: /Erin M. Nichols/
Erin M. Nichols

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is submitted pursuant to 37 C.F.R. § 41.37 for the above-referenced patent application in response to the Notice of Appeal filed on July 22, 2009.

Please charge deposit account 50-3581 (IHN.065.WUS) in the amount of $540.00 for filing this brief in support of an appeal as set forth in 37 C.F.R. § 41.20(b)(2). If necessary, authority is given to charge/credit deposit account 50-3581 (IHN.065.WUS) additional fees/overages in support of this filing.

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I. REAL PARTY IN INTEREST

The real party in interest is the assignee, Nokia Corporation.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals, interferences, or judicial proceedings that would have a bearing on the Board's decision in the instant appeal.

III. STATUS OF CLAIMS

Claims 1, 6-11, 13-21, 23, 26, and 27 are pending, and claims 2-5, 12, 22, 24, and 25 have been canceled. Claims 1, 6-11, 13-21, 23, 26, and 27 have been finally rejected by the Examiner's action dated March 10, 2009 (hereinafter "final Office Action"), from which Appellant appeals.

A copy of claims 1, 6-11, 13-21, 23, 26, and 27, which are the subject of this appeal, may be found in the Claims Appendix (section VIII) at pages 17-20.

IV. STATUS OF AMENDMENTS

No amendments were presented subsequent to the final rejection dated March 10, 2009.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed invention provides for performing operations in an electronic device by machine reading data storage elements, such as radio frequency tags, in a user manual. For example, a user may need to troubleshoot a problem with the operation of an electronic device. Once the appropriate page of the device's user manual is located, the device may be used to read a data storage element on that page so that the necessary functions may be automatically performed, or the user may be guided through the process, to solve the problem. The invention allows for tedious and complex troubleshooting functions to be performed simply by locating a suitable data storage element and using the electronic device to read the located data storage element.

One embodiment of the present invention is directed to an arrangement. *See, e.g.*, claim 1; Fig. 3; and the corresponding discussion in the original specification at page 6, line 24 through page 7, line 5. The arrangement includes an electronic device (*e.g.*, 200) and a user manual (*e.g.*, 320) associated with the electronic device. The user manual includes a plurality of radio frequency tags (*e.g.*, 322A, 322B, 322C) attached on the pages of the user manual such that each radio frequency tag is readable without interference from other radio frequency tags in the user manual (*see, e.g.*, page 3, line 26 through page 4, line 8). Each radio frequency tag includes software instructions relating to an operation described in the manual and associated with said radio frequency tag (*see, e.g.*, page 5, lines 2-22). The electronic device includes a reader (*e.g.*, 202) for reading the plurality of radio frequency tags and is operable, in response to machine reading at least one of the plurality of radio frequency tags attached in the user manual, to execute the software instructions read from said at least one radio frequency tag to perform a device operation that is described in the user manual in connection with said at least one radio frequency tag.

Another embodiment of the present invention is directed to an electronic device. *See, e.g.*, claim 15; Figs. 3 and 4; and the corresponding discussion in the original specification at page 6, line 24 through page 8, line 9. The electronic device (*e.g.*, 200) includes at least a reader (*e.g.*, 402) and a controller (*e.g.*, 408). The reader reads any of a plurality of radio frequency tags (*e.g.*, 422) from a user manual associated with the electronic device. The user manual includes the plurality of radio frequency tags on the

pages of the user manual positioned such that they are machine readable without interfering with each other (*see, e.g.*, page 3, line 26 through page 4, line 8), and each radio frequency tag stores software instructions relating to a device operation described in the user manual and associated with said radio frequency tag (*see, e.g.*, page 5, lines 2-22). The controller is operable, in response to machine reading at least one of the plurality of radio frequency tags attached in the user manual, to execute the software instructions read from said at least one radio frequency tag to perform a device operation that is described in the user manual in connection with said at least one radio frequency tag.

Another embodiment of the present invention is directed to a user manual. *See, e.g.*, claim 21; Fig. 3; and the corresponding discussion at page 6, line 24 through page 7, line 5. The user manual (*e.g.*, 320) includes a plurality of radio frequency tags (*e.g.*, 322A, 322B, 322C), where each tag stores software instructions relating to a device operation described in the user manual (*see, e.g.*, page 5, lines 2-22). The radio frequency tags are attached on the pages of the user manual such that each radio frequency tag is readable without interference from other radio frequency tags in the user manual (*see, e.g.*, page 3, line 26 through page 4, line 8).

Another embodiment of the present invention is directed to a method. *See, e.g.*, claim 23; Figs. 1A-1B; and the corresponding discussion at page 3, lines 19 through page 6, line 6. The method includes reading (*e.g.*, 110, 110B), using an electronic device, at least one radio frequency tag from a user manual. The user manual includes a plurality of radio frequency tags attached on the pages of the user manual such that each radio frequency tag is readable without interference from other radio frequency tags in the user manual (*see, e.g.*, page 3, line 26 through page 4, line 8). Each radio frequency tag stores software instructions relating to a device operation described in the user manual and associated with the radio frequency tag (*see, e.g.*, page 5, lines 2-22). The method also includes performing (*e.g.*, 112, 112BA, 112BB), in the electronic device, on the basis of the software instructions read from at least one radio frequency tag, a device operation that is described in the user manual in connection with said at least one radio frequency tag.

As required by 37 C.F.R. § 41.37(c)(1)(v), a concise explanation of the subject matter defined in each of the independent claims involved in the appeal is provided herein. Appellant notes that representative subject matter is identified for each of these claims;

however, the abundance of supporting subject matter in the application prohibits identifying all textual and diagrammatic references to each claimed recitation. Appellant thus submits that other application subject matter, which supports the claims but is not specifically identified above, may be found elsewhere in the application. Appellant further notes that this summary does not provide an exhaustive or exclusive view of the present subject matter, and Appellant refers to the appended claims and their legal equivalents for a complete statement of the invention.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The sole ground of rejection is as follows:

> Claims 1, 6-11, 13-21, 23, 26, and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2005/0175973 by Miller (hereinafter "Miller") in view of U.S. Patent No. 6,655,586 to Back *et al.* (hereinafter "Back").

VII. ARGUMENT

A. The § 103(a) rejection of claims 1, 6-11, 13-21, 23, 26, and 27 is improper because the asserted teachings of Miller and Back alone, or in combination, fail to teach or suggest each of the claimed limitations.

Neither of the asserted references teaches at least radio frequency tags including software instructions relating to an operation described in a user manual where an electronic device, in response to machine reading at least one of those radio frequency tags, executes the software instructions read from the at least one radio frequency tag to perform a device operation that is described in the user manual, as claimed in each of the independent claims. This failure to correspond to the claimed limitations is acknowledged by the Examiner in the final Office Action and the Advisory Action dated July 6, 2009.

First, the Examiner correctly acknowledges (at page three of the final Office Action) that Miller at least does not teach or suggest a device "operable, in response to machine reading at least one of the plurality of radio frequency tags attached in the user manual, to execute the software instructions read from said at least one radio frequency tag. . . ." Rather, Miller teaches that an actuator in a textbook is positively activated to generate and transmit a signal to a receiver at a computing device which accesses electronically stored information that supplements the textbook. In an effort to overcome this deficiency, the teachings of Back are relied upon. However, this reliance is improper since Back also fails to at least teach executing "software instructions read from said at least one radio frequency tag to perform a device operation that is described in the user manual in connection with said at least one radio frequency tag".

Second, the Examiner correctly acknowledges (at page two of the Advisory Action) that Back's "page identification management system determines whether the page identifications have related dynamic content" and "the page identification management system forwards control information to the appropriate dynamic content device" (emphasis added). Back teaches that pages of a book embed an identifying tag (asserted as corresponding to the claimed radio frequency tags) where the tag only identifies the page of the book (*see, e.g.*, Abstract). The tag does not include software instructions. Moreover, Back's tag identification reader is located in the cover of the same book

containing the pages with embedded identification tags (Col. 2, lines 16-47). In contrast to the claimed invention, any dynamic content associated with a page of Back's book is stored and controlled by the page management system 500, not the page identification tags (Col. 2, lines 60-65) nor the reader in the cover of the book. Thus, the Examiner acknowledges that neither Miller nor Back teaches that software instructions are read from at least one radio frequency tag by an electronic device to perform a device operation that is described in the user manual in connection with said at least one radio frequency tag.

In the Advisory Action, the Examiner also asserts for the first time that Back's reference (at column three) to the Tag-it™ system suggests that it would be well-known for identification tags to have embedded software that when read, cause a reader to execute information embedded in the tag. However, no evidence has been provided in support of this assertion, and instead, the Examiner appears to be impermissibly asserting that facts outside of the record, which are capable of instant and unquestionable demonstration as being well known or obvious to one skilled in the art, would be combined with the teachings of Miller.

First, allegations concerning specific knowledge of the prior art should be supported and the applicant should be given the opportunity to challenge the correctness of such assertions and allegations. The facts so noticed serve to "fill the gaps" which might exist in the evidentiary showing and should not comprise the principle evidence upon which a rejection is based. MPEP § 2144.03, citing *In re Ahlert* 424 F.2d 1088, 1091, 165 USPQ 418, 420-421 (CCPA 1970). The unsupported assertion does not provide any evidence that Back's identification tags have embedded software instructions, does not overcome the above-discussed deficiencies in the teachings of Miller, and does not provide any evidence that such asserted facts would be combined with the teachings of Miller.

Second, the disclosure of Back does not support the Examiner's assertion. Back teaches that the page identification tags may be a radio frequency identification product such as the Tag-it™ system. There is no suggestion in Back that such an identification product would include tags having embedded software, as claimed. Rather, Back teaches only that the identification tags identify a page number (Col. 3, lines 54-57). Moreover, the current and only-available version of the incorporated Tag-it™ Reader System Series 320 Reference Guide (Tag-it™ Reader System Series 6000 Reference Guide, attached in

the Evidence Appendix) makes no mention of identification tags, as disclosed in Back, including embedded software as asserted. Rather, the Series 6000 Reference Guide mentions data associated with Tag-it™ transponders briefly at pages 12 and 20, without any suggestion that such data would include software instructions. Thus, Back teaches that the identification tags include only page numbers and the incorporated information provides no further evidentiary support for the Examiner's assertion. Without the requisite evidence to support the Examiner's assertion of well-known subject matter, the assertion fails to properly support the § 103(a) rejection and overcome the admitted deficiencies in the teachings of Miller.

In summary, Miller does not teach a device "operable, in response to machine reading at least one of the plurality of radio frequency tags attached in the user manual, to execute the software instructions read from said at least one radio frequency tag. . . ." The reliance on Back is misplaced since Back's identification tags do include software instructions thereby failing to correspond to the claimed radio frequency tags. Moreover, even if Back's identification tags could include software instructions, the device machine reading Back's identification tags (the reader in the cover of the book) is not the device operable to execute the software instructions. Rather, as acknowledged by the Examiner, the operable device is the page identification management system, not the reader. Since neither Miller nor Back teaches at least executing software instructions read from radio frequency tags in a user manual to perform a device operation described in the user manual, as claimed, any combination thereof must also fail to teach or suggest such limitations.

In addition, the combination of Miller and Back has not been shown to correspond to several other claim limitations. For example, neither of the asserted references has been shown to teach a user manual associated with an electronic device. Rather, Miller and Back are directed to textbooks and books, respectively, where neither has been shown to be a user manual associated with an electronic device as claimed. Similarly, the asserted "software instructions" of Miller are not related to an operation described in the textbook. Rather, the asserted software instructions of Miller merely cause a device to display additional information (Abstract, Fig. 3). Moreover, it has not been asserted or shown that the plurality of page identification tags of Back are readable without interference from

other page identification tags in Back's book, as claimed. Without correspondence to each of the claimed limitations, the § 103(a) rejection is improper.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974); and moreover, "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). *See, e.g.*, MPEP § 2143.03. The limitations directed to at least executing software instructions read from the at least one radio frequency tag to perform a device operation that is described in a user manual appear to have been ignored and are not taught by Miller or Back. Without a presentation of correspondence to each of the claimed limitations, the § 103(a) rejection is improper, and Appellant accordingly requests that the rejection be reversed.

Dependent claims 6-11, 13, 14, 16-20, 22, 26, and 27 depend from independent Claims 1 and 15, respectively. Each of these dependent claims also stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the asserted combination of Miller and Back. While Appellant does not acquiesce to any particular rejections to these dependent claims, including any assertions concerning descriptive material, obvious design choice and/or what may be otherwise well-known in the art, these rejections are moot in view of the above remarks made in connection with the independent claims. These dependent claims include all of the limitations of their respective base claims and any intervening claims and recite additional features which further distinguish these claims from the cited references. "If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious." MPEP § 2143.03; *citing In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, dependent claims 6-11, 13, 14, 16-20, 22, 26, and 27 are also patentable over the asserted combination of Miller and Back.

1. The asserted teachings of Miller do not teach or suggest the limitations of dependent claims 7-9 and 17.

In support of the rejection of dependent claims 7-9 and 17, the Examiner relies upon the same portions of Miller as cited against independent claims 1 and 15 without any further explanation or alignment. No portion of Miller teaches or suggests performing a

device operation in a tutorial way, as claimed. Rather, the asserted device operation of Miller (display of additional content on a screen) does not involve at least a tutorial of how to display the content, a step-by-step manner of displaying the content, or taking proceed indications from a user to proceed to a next step. Without a presentation of correspondence to each of the claimed limitations, the § 103(a) rejection of at least claims 7-9 and 17 is improper. Appellant accordingly requests that the rejection be reversed.

2. The asserted teachings of Miller do not teach or suggest the limitations of dependent claims 10, 11, 18, and 19.

In support of the rejection of dependent claims 10, 11, 18, and 19, the Examiner relies upon the same portions of Miller as cited against independent claims 1 and 15 without any further explanation or alignment. No portion of Miller teaches or suggests adding or replacing software code in a reading electronic device, as claimed. Moreover, there is no suggestion that usage of software instructions is limited to a predetermined number of usage times or to a predetermined time. In contrast, Miller's transmitted signal merely initiates the display of additional information stored on an electronic storage medium. Without a presentation of correspondence to each of the claimed limitations, the § 103(a) rejection of at least claims 10, 11, 18, and 19 is improper. Appellant accordingly requests that the rejection be reversed.

3. The asserted teachings of Miller do not teach or suggest the limitations of dependent claim 20.

In support of the rejection of dependent claim 20, the Examiner relies upon the same portions of Miller as cited against independent claim 15 without any further explanation or alignment. No portion of Miller teaches or suggests reading a media content from a radio frequency tag, as claimed. Moreover, there is no suggestion that a media content is added to a media base of the electronic device reading the radio frequency tag. Again, Miller's transmitted signal merely initiates the display of additional information stored on an electronic storage medium. Without a presentation of

correspondence to each of the claimed limitations, the § 103(a) rejection of at least claim 20 is improper. Appellant accordingly requests that the rejection be reversed.

4. The asserted teachings of Miller do not teach or suggest the limitations of dependent claim 26.

In support of the rejection of dependent claim 26, the Examiner relies upon the same portions of Miller as cited against independent claim 1 without any further explanation or alignment. This reliance on Miller is illogical as the Examiner acknowledges that Miller "fails to teach a plurality of radio frequency tags" (page 3, line 16 of the final Office Action). Thus, the same portion of Miller cannot teach or suggest that the radio frequency tags are positioned on different ends of neighboring pages of the user manual, as claimed. Without a presentation of correspondence to each of the claimed limitations, the § 103(a) rejection of at least claim 26 is improper. Appellant accordingly requests that the rejection be reversed.

5. The asserted teachings of Miller do not teach or suggest the limitations of dependent claim 27.

In support of the rejection of dependent claim 27, the Examiner relies upon the same portions of Miller as cited against independent claim 1 without any further explanation or alignment. No portion of Miller teaches or suggests radio frequency tags having a reading distance such that they are readable only by touching the radio frequency tag with the reader of the electronic device, as claimed. Moreover, the identification tags of Back would not correspond to such limitations since Back's reader is located in the cover of the same book containing the identification tags. Without a presentation of correspondence to each of the claimed limitations, the § 103(a) rejection of at least claim 27 is improper. Appellant accordingly requests that the rejection be reversed.

B. The § 103(a) rejection of claims 1, 6-11, 13-21, 23, 26, and 27 is improper because the requisite rationale to combine these references, as asserted, has not been articulated.

In addition to having to show that the asserted combination of references teaches or suggests all of the claim limitations, the Examiner must articulate reasoning with some rational underpinning to support the asserted conclusion of obviousness. Appellant respectfully submits that this requirement has not been met.

The requisite evidence of motivation to combine the cited references as asserted has not been presented, nor does such motivation exist based on the cited references. In the Office Action, the proffered motivation to modify Miller is "to execute the software enabling the electronic media stored to be displayed on the computing device." However, Miller already teaches allowing "the user to positively direct the computing device 24 to play electronic media stored on an electronic storage device or medium" (cited paragraph [0017]). No evidence or rationale has been provided to modify Miller to perform functions that Miller already performs. As such, Appellant respectfully asserts that the Examiner's conclusion of obviousness is, instead, based on improper hindsight reasoning using knowledge gleaned only from Appellant's disclosure. As stated by the Federal Circuit:

> Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight.

In re Dembiczak, 50 USPQ2d 1614, (Fed. Cir. 1999) (*citing Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985)). Without a suggestion of the desirability of "the combination," a combination of such references is made in hindsight, and the "range of sources available, however, does not diminish the requirement for actual evidence." *Id.* It is a requirement that actual evidence of a suggestion, teaching or motivation to combine prior art references be shown and that this evidence be "clear and particular." *Id.* Broad conclusory statements regarding the teaching of multiple references, standing alone, are not evidence. *Id.*

Further, the asserted modification of Miller would improperly undermine the teachings of Miller. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation

to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP § 2143.01(V). Miller is directed to providing a user with the ability to control the initiation and replay of further functions associated with a book (paragraph [0005], last sentence). Modifying Miller to automatically perform additional functions associated with the book based upon the page the user's book is open to, as taught by Back, would remove the user's control over the additional functions.

Since the proposed modification of Miller is illogical and would improperly undermine the teachings of Miller, the requisite rationale to support a § 103(a) rejection has not been articulated. Thus, the proposed modification fails to support a *prima facie* § 103(a) rejection.

C. Conclusion

In view of the above, Appellant respectfully submits that the invention set forth in claims 1, 6-11, 13-21, 23, 26, and 27 is patentable and that the rejection of claims 1, 6-11, 13-21, 23, 26, and 27 should be reversed. Appellant respectfully requests reversal of the rejection as applied to the appealed claims and allowance of the application with respect to the appealed claims.

Authorization to charge the undersigned's deposit account is provided on the cover page of this brief.

Respectfully submitted,

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VIII. CLAIMS APPENDIX

1. An arrangement comprising:

an electronic device and a user manual associated with the electronic device, including a plurality of radio frequency tags attached on the pages of the user manual such that each radio frequency tag is readable without interference from other radio frequency tags in the user manual, each radio frequency tag including software instructions relating to an operation described in the manual and associated with said radio frequency tag, wherein

the electronic device includes a reader for reading of the plurality of radio frequency tags, and being operable, in response to machine reading at least one of the plurality of radio frequency tags attached in the user manual, to execute the software instructions read from said at least one radio frequency tag to perform a device operation that is described in the user manual in connection with said at least one radio frequency tag.

6. The arrangement of claim 1, wherein the device operation is performed automatically.

7. The arrangement of claim 6, wherein the device operation is performed in a tutorial way.

8. The arrangement of claim 7, wherein the tutorial way proceeds in a step-by-step manner, and the device operation proceeds to a next step when a predefined or user-adjustable time has elapsed.

9. The arrangement of claim 7, wherein when performing the device operation in the tutorial way, the operation proceeds in a step-by-step manner by taking proceed indications from a user of the device.

10. The arrangement of claim 1, wherein read software instructions are added to an existing software code in the device or replace an existing software code portion in the device.

11. The arrangement of claim 10, wherein usage of the read software instructions is limited to a predetermined number of usage times or to a predetermined time.

13. The arrangement of claim 1, wherein the radio frequency tags include information for starting an application at the electronic device.

14. The arrangement of claim 1, wherein the electronic device is a mobile phone.

15. An electronic device comprising:

a reader for reading any of a plurality of radio frequency tags from a user manual associated with the electronic device, the user manual including the plurality of radio frequency tags on the pages of the user manual positioned such that they are machine readable without interfering with each other, each radio frequency tag storing software instructions relating to a device operation described in the user manual and associated with said radio frequency tag, wherein the electronic device further includes a

controller operable, in response to machine reading at least one of the plurality of radio frequency tags attached in the user manual, to execute the software instructions read from said at least one radio frequency tag to perform a device operation that is described in the user manual in connection with said at least one radio frequency tag.

16. The device of claim 15, wherein the controller is arranged to start an application in the device.

17. The device of claim 15, wherein the controller is arranged to illustrate performing of an operational setting in a step-by-step manner, step transitions being triggered by expiry of a timer or by pressing of a key of the device.

18. The device of claim 15, wherein the reader is arranged to read a software code portion from a radio frequency tag and the controller is arranged to add the software code portion to an existing code base in the device.

19. The device of claim 15, wherein the reader is arranged to read a software code portion from a radio frequency tag and the controller is arranged to replace an existing software code portion in the device with the read software code portion.

20. The device of claim 15, wherein the reader is arranged to read a media content from a radio frequency tag and the controller is arranged to add the media content to a media base of the device.

21. A user manual comprising a plurality of radio frequency tags, each storing software instructions relating to a device operation described in the user manual, the radio frequency tags being attached on the pages of the user manual such that each radio frequency tag is readable without interference from other radio frequency tags in the user manual.

23. A method comprising:

reading, by using an electronic device, at least one radio frequency tag from a user manual including a plurality of radio frequency tags attached on the pages of the user manual such that each radio frequency tag is readable without interference from other radio frequency tags in the user manual, each radio frequency tag storing software instructions relating to a device operation described in the user manual and associated with the radio frequency tag,

performing, in the electronic device, on the basis of the software instructions read from at least one radio frequency tag, a device operation that is described in the user manual in connection with said at least one radio frequency tag.

26. The arrangement of claim 1, wherein the radio frequency tags are positioned on different ends of neighboring pages of the user manual.

27. The arrangement of claim 1, wherein the radio frequency tags have a reading distance such that they are readable only by touching the radio frequency tag with the reader of the electronic device.

IX. EVIDENCE APPENDIX

In the Advisory Action dated July 6, 2009, the Examiner relies upon the Texas Instruments Tag-it™ system as disclosed in the cited patent of record, U.S. Patent No. 6,655,586 to Back *et al*. This patent of record incorporates by reference the Tag-it™ Reader System Series 320 Reference Guide.

In an effort to evaluate the evidence relied upon by the Examiner as to the grounds of rejection to be reviewed on appeal, Appellant obtained a copy of the Tag-it™ Reader System Series 6000 Reference Guide, by Texas Instruments published in January 2001. Page two of this Reference Guide states, "This is the second edition of this manual. It describes the **Tag-it Reader System Series 6000 (formerly published as Series 320)**." Therefore, it is believed that the attached Series 6000 Reference Guide is the only available version of the Series 320 Reference Guide incorporated by reference by the patent of record, U.S. Patent No. 6,655,586.

Accordingly, attached please find a copy of the Tag-it™ Reader System Series 6000 Reference Guide, by Texas Instruments and published in January 2001 (pages 1-30).

TEXAS INSTRUMENTS

Tag-it™ Reader System Series 6000

Reader Module RI-R00-320A

Reader Module with RS232 Interface RI-R00-321A

Reference Guide

11-06-21-048 January 2001

Tag-it™

Edition Two - January 2001

This is the second edition of this manual. It describes the **Tag-it Reader System Series 6000 (formerly published as Series 320).**

It contains a description of the following modules:

Reader Module	RI-R00-320A
Reader Module with RS232 Interface	RI-R00-321A

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Read This First

About This Manual

This reference guide for the Tag-it Reader System Series 6000 is designed for use by TI partners who are engineers experienced with TIRIS and Radio Frequency Identification Devices (RFID).

Regulatory, safety and warranty notices that must be followed are given in Chapter 5.

Conventions

WARNING:

A WARNING IS USED WHERE CARE MUST BE TAKEN, OR A CERTAIN PROCEDURE MUST BE FOLLOWED IN ORDER TO PREVENT INJURY OR HARM TO YOUR HEALTH.

CAUTION:

This indicates information on conditions which must be met, or a procedure which must be followed, which if not heeded could cause permanent damage to the equipment or software.

Note:

Indicates conditions which must be met, or procedures which must be followed, to ensure proper functioning of the equipment or software.

Information:

Indicates information which makes usage of the equipment or software easier

If You Need Assistance

For more information, please contact the sales office or distributor nearest you. This contact information can be found on our web site at:

http://www.tiris.com

Document Overview

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CHAPTER 1

Introduction

This chapter introduces you to the Tag-it™ Reader System Series 6000.

Topic **Page**

1.1 General

The Tag-it™ Reader System Series 6000 works at a frequency of 13.56 MHz. It comprises a reader, antenna, and transponders. This reference guide provides details about the Tag-it Reader Module which is available with or without an RS232 interface board.

The Tag-it Reader Module handles all RF and digital functions required in order to read Tag-it transponders. The Tag-it RS232 Interface Board provides signal level conversion and serial interface for the reader.

Figure 1: Tag-it Reader Module (RI-R00-320A)

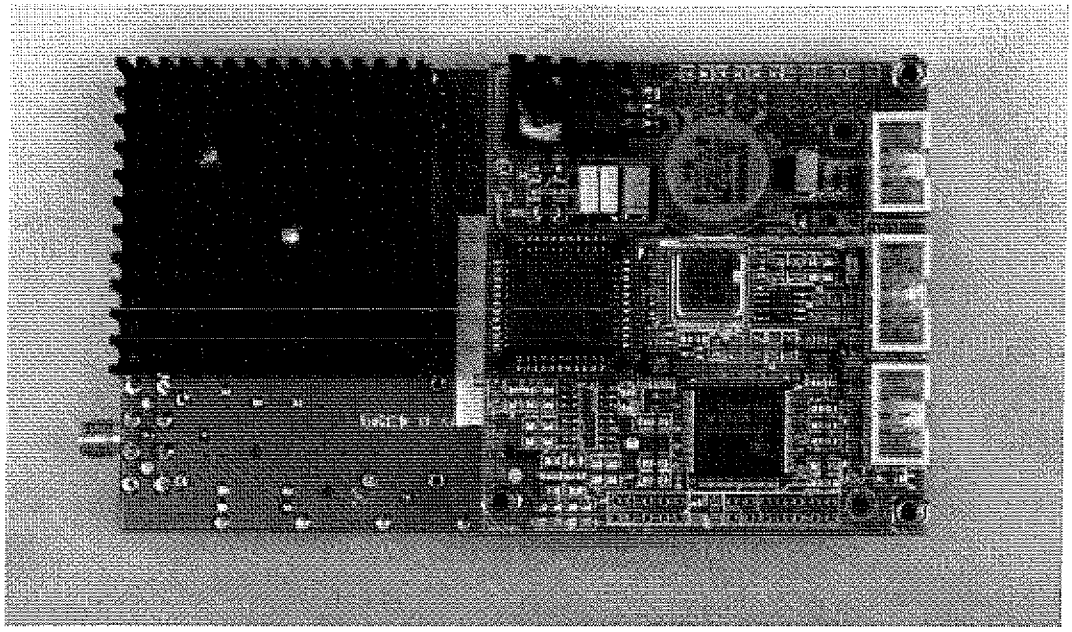
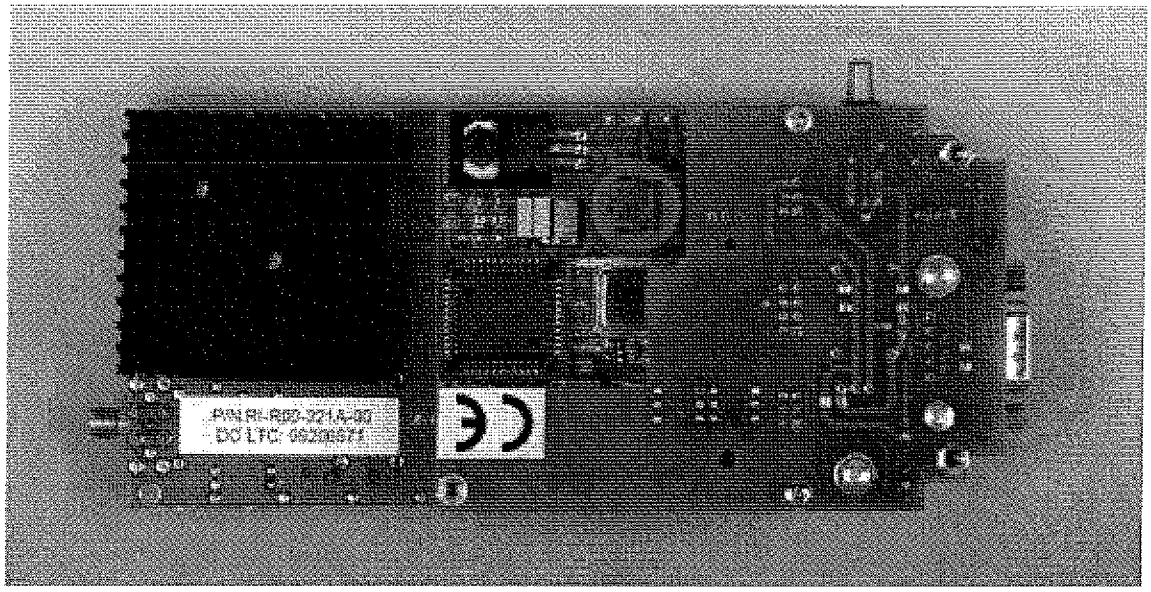


Figure 2: Tag-it Reader Module with RS232 Interface (RI-R00-321A)



CHAPTER 2

Reader Module 320A

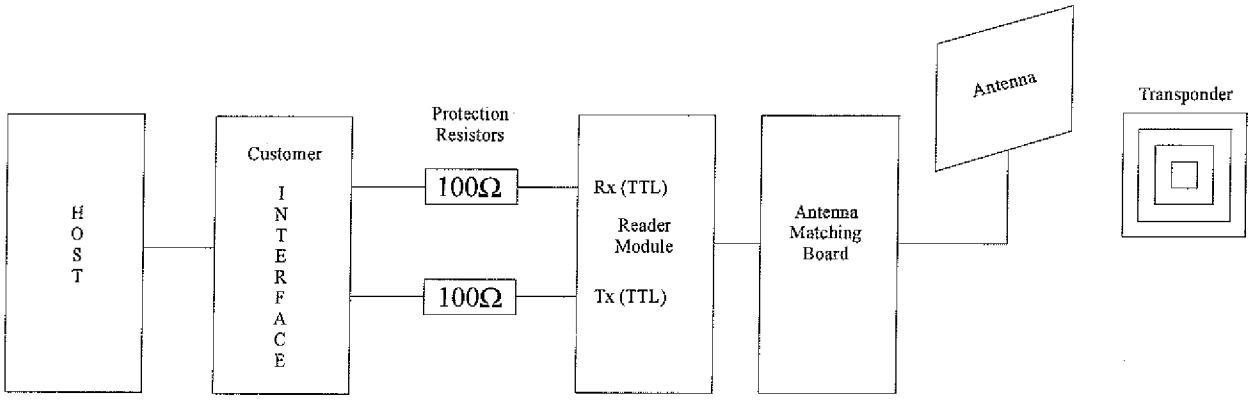
This chapter describes the Tag-it™ Reader Module 320A. It describes the module's functionality, its interfaces, and finally it provides all the information that you need in order to install the module.

Topic **Page**

2.1 General

The Tag-it™ Reader Module 320A consists of a transmitter, receiver and digital control module, which communicates with individual tags. The reader is designed to be integrated into and controlled by an existing host system such as a PC, a larger computer system, or other intelligent device (for example: a ticket printer or fixed point identification scanner) through an external (for example: RS232) interface (not part of this module).

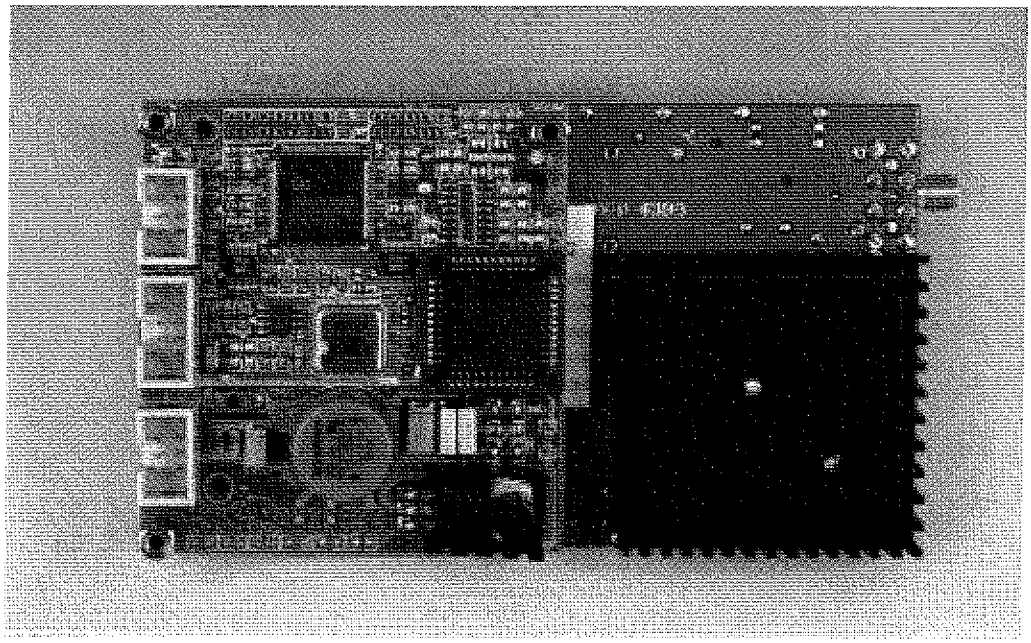
Figure 3: Basic System Overview (RI-R00-320A)



Note:

We strongly recommend that you use two 100 Ω series protection resistors on the TTL-level Rx/Tx lines (J2 pins 1 & 3) as shown in Figure 4 in order to avoid damaging the 320A reader module.

Figure 4: Reader Module (RI-R00-320A) - Top view



2.2 Functional Description

The Tag-it Reader Module:

- Combines the analog RF and digital capabilities of two sub-assembly boards
- Integrates RF transmit and receive functionality
- Includes Tag-it firmware that provides functionality for linking with host computer systems and reading the transponder signals.

Other functionality onboard includes the following:

- Common Mode noise filter
- Single 12-Volt power supply connector
- Asynchronous serial port with 19,200 Baud
- Expansion port for reader synchronization
- Connector for antenna.

The Tag-it Reader Module provides an antenna output that is matched to an impedance of 50 Ohms at 13.56 MHz.

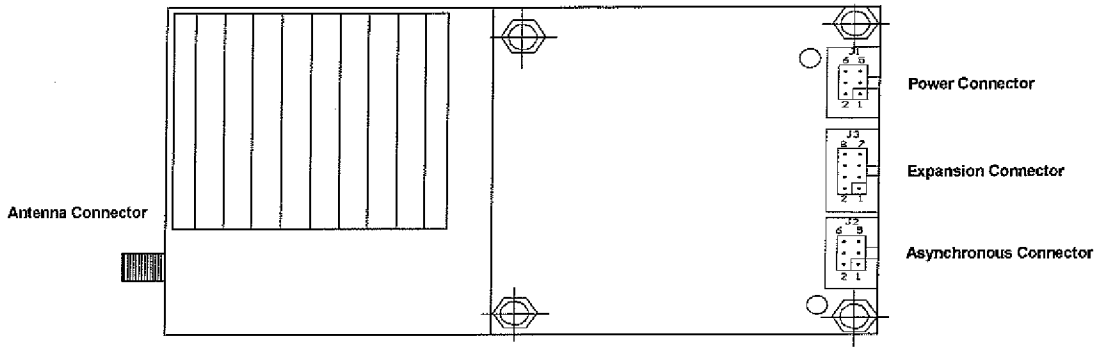
2.3 Reader Module Interfaces

The power, asynchronous and the expansion connectors are located on the right-hand side of the Reader Module. The SMA antenna connector is positioned on the opposite side.

The connectors are as follows:

- power supply (J1), a 6-pin double row male connector with a pitch of 2.54 mm
- antenna (SMA) connector
- asynchronous serial port (J2), a 6-pin double-row male connector with a pitch of 2.54 mm
- expansion port (J3), an 8-pin double row male connector with a pitch of 2.54 mm.

Figure 5: Reader Module (RI-R00-320A) Interfaces



2.3.1 Connectors

Table 1: Reader Board Power (J1) Pin Connections

J1, Power Connector (double row, male)		
Pin #	**Connection**	
1	+12 V	Input Voltage
2	+12 V	Input Voltage
3	Not used	
4	Not used	
5	Ground (PGND-1)	Ground Input Power Supply
6	Ground (PGND-1)	Ground Input Power Supply

Table 2: Reader Board TTL Asynchronous (J2) Pin Connections

J2, TTL Asynchronous Connector (double row, male)		
Pin #	**Connection**	
1	Transmit data (TX)	Data Reader to Host, TTL-level
2	NC	Not connected
3	Receive data (RX)	Data Host to Reader, TTL-level
4	NC	Not connected
5	Ground (GND)	Reference point for signals
6	NC	Not connected

Table 3: Reader Board TTL Expansion (J3) Pin Connections

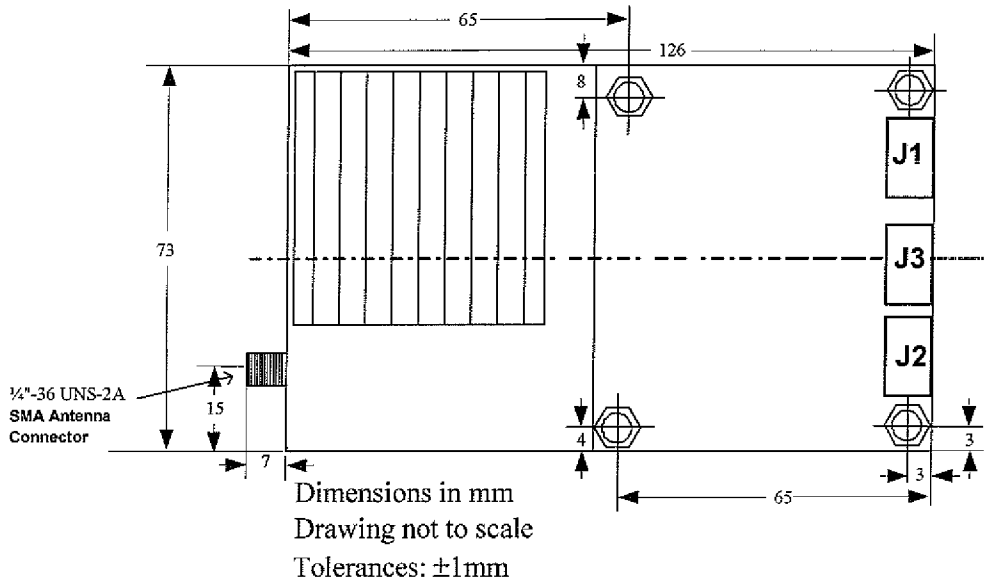
J3, TTL Expansion Connector		
Pin #	**Connection**	
1	NA	Not supported
2	NA	Not supported
3	NA	Not supported
4	NA	Not supported
5	Signal Ground (GND)	Reference point for signals
6	Signal Ground (GND)	Reference point for signals
7	Signal Input	Input reserved for future use (synchronization)
8	Signal output	Output reserved for future use (synchronization)

CAUTION:

Do not connect the ground signals of the Power Connector (J1 pins 5 and 6: PGND-1) and other GND pins (J2 pin 5, J3 pins 5 and 6) directly to each other; otherwise the ground leg of the common mode coil implemented on the reader will be rendered ineffective.

2.3.2 Dimensions

Figure 6: Reader Module (RI-R00-320A) Dimensions



2.4 Installation

2.4.1 What You Will Need

- 2 connectors (female) straight, double row 6-pin (pitch 2.54, height 7 mm)
- 1 connector (female) straight, double row 8-pin (pitch 2.54, height 7 mm)
- 1 connector for antenna cable Type RF-SMA (male/SW 8)
- 4 screws M3x(XX) (XX = length depends on the wall thickness of the object to mount on)
- Power supply 12 V ± 5%, min. 1.3 A
- PC with RS232 Interface and installed software, for example:
  "Tag-it Navigator" (RI-S00-NAV1)
- A custom RS232 Interface board is required for the 320A reader (an interface board is delivered with the 321A reader, the 320A reader only provides TTL-level asynchronous serial signals on interface connectors).

Recommended for Reader RF-Power adjustment:

- Oscilloscope,
  min. 30 MHz, to measure peak-to-peak values at resolutions of 0.1 Vpp
- 50 Ω dummy load (inductive free) for antenna representation
- Tuning screwdriver

Information:

We recommend that you use the Tag-it Navigator™ to control the Tag-it reader.

Tag-it Navigator is a Windows program capable of communicating with the Tag-it Commander reader units via a standard serial interface. It supports the Host Protocol implemented in the reader, allowing all supported commands to be executed, for example: writing and reading data to and from Tag-it transponders.

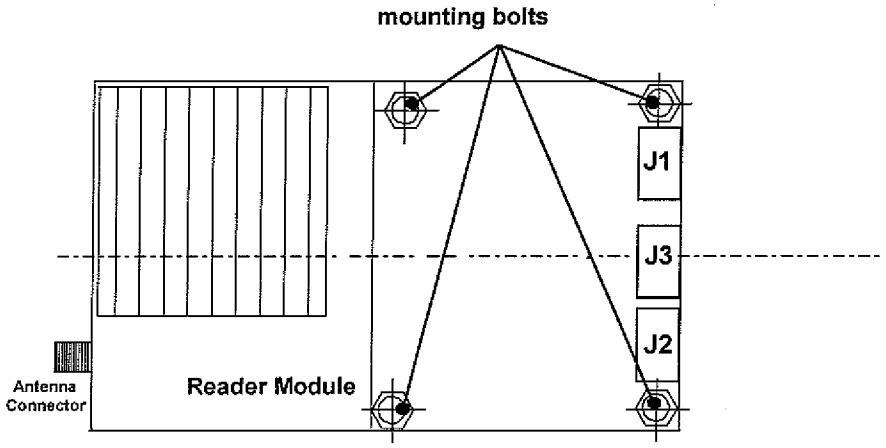
Tag-it Navigator is a tool, which can be used for reader setup, tuning, or diagnosis. Additionally, it can log transponder responses for initial experimentation and testing with the Tag-it System. It provides data and time information, and can display the acquired data in a number of different formats.

The Tag-it Navigator can be obtained from your nearest TIRIS Sales Office, or downloaded from the TIRIS Web Site **http://www.tiris.com**.

2.4.2 Mounting

- Place the Reader Module carefully into or onto the object or housing that has been prepared with holes for the mounting bolts.
- Secure the Reader Module to the object/housing using the four screws for the mounting bolts.

Figure 7: Mounting Bolts (RI-R00-320A)



WARNING:

THE HEAT SINKS OF THE READER MODULE CAN GET HOT (APPROXIMATELY 80°C). THEREFORE, BE CAREFUL NOT TO TOUCH THE HEAT SINKS WHEN THE READER IS TURNED ON. HANDLE THE READER MODULE WITH CARE TO AVOID BEING BURNT.

MAKE SURE YOU HAVE SELECTED PROPER MOUNTING MATERIALS, WHICH WITHSTAND THESE TEMPERATURES.

2.4.3 Attaching Cables and Interfacing

- Connect the data communication cables to connector J2 or the serial interface board (note that J2 is TTL-level only!).
- Attach the antenna.
- Attach the power supply.

CAUTION:

Make sure the power supply is switched to "OFF" before connecting the power cable.

Connector misalignment can damage the Reader Module.

2.4.4 Transmitter Output Power

The reader output power can be adjusted by potentiometer R3. The location of potentiometer R3 is shown in Figure 8.

Perform the following steps in order to achieve proper hardware and software conditions:

- Connect the 50 Ω dummy load to the SMA antenna connector.
- Switch power at PC and power supply for Reader Module to "On".
- Start the software, for example: "Tag-it Navigator".
- Set command "Transmitter" to "On" Continuous Wave (CW).
- Measure peak-to-peak voltage across the dummy load with scope at impedance of 1 MΩ.
- Calculate the transmitted power regarding the following equation:

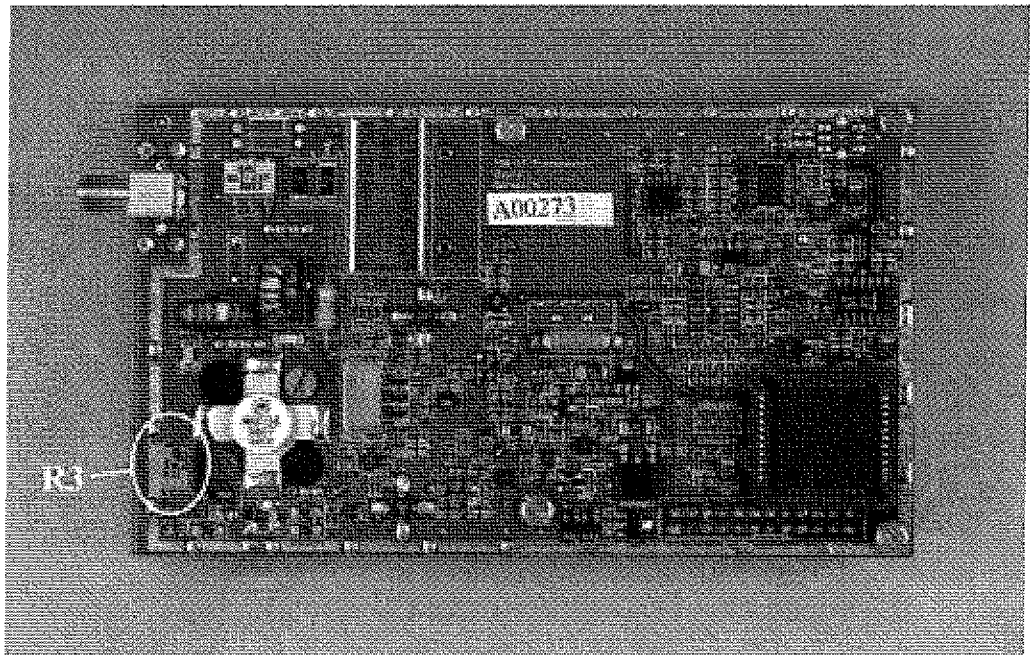
$$P = V^2eff/R \Rightarrow Vpp = 2.82 \sqrt{(P\ 50\Omega)}$$

Table 4 shows some approximate reference values that can be expected.

Table 4: Reference values for tuning the Reader Module (RI-R00-320A)

Voltage (Vpp)	6.30	14.1	19.9
Power in mW	100	500	1000

Figure 8: Location of Potentiometer R3 (RI-R00-320A)



CHAPTER 3

Reader Module 321A (with RS232

This chapter describes the Tag-it Reader Module 321A which includes an RS232 Interface. It provides information about the module itself, its interfaces and finally, how to install it.

Topic **Page**

3.1 General

The Tag-it™ Reader Module 320A consists of a transmitter, receiver and digital control module, which communicates with individual tags. The reader is designed to be integrated into and controlled by an existing host system such as a PC, a larger computer system, or other intelligent device (for example: a ticket printer or fixed point identification scanner) through its RS232 interface.

The Tag-it™ RS232 Interface board attached to the Reader Module is specially designed for the Tag-it Reader Module, provides all required functions to communicate with a standard host system, such as a PC.

Figure 9: Basic System Overview (RI-R00-321A)

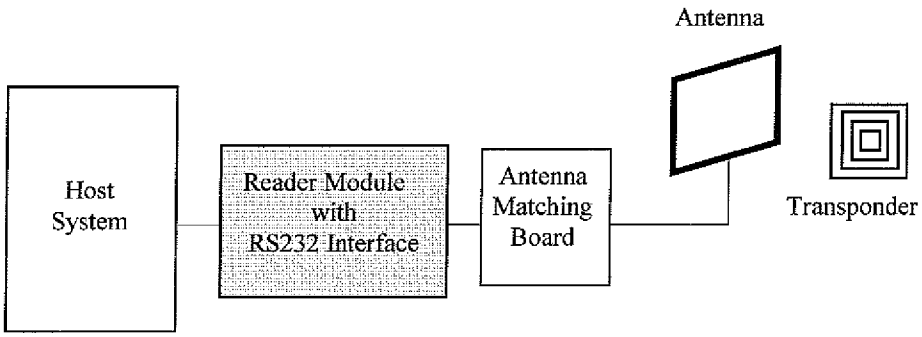
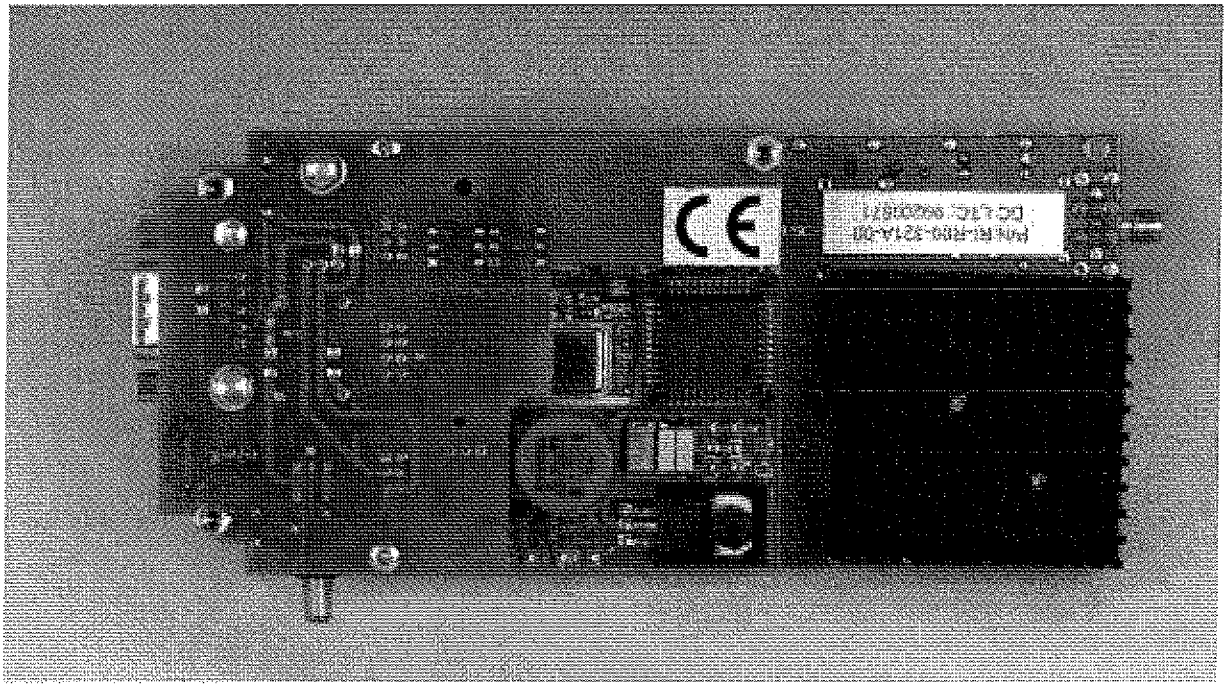


Figure 10: Reader Module (RI-R00-321A) - Top view



3.2 Functional Description

The Reader Module 321A (RI-R00-321A) has the same functionality as the Reader Module 320A (RI-R00-320A) but also comprises an RS232 Interface Module attached to it.

The RS232 Interface module converts the asynchronous TTL signals of the Reader Module to standard RS232 signals. The TTL input/output interface is augmented with a serial interface when the Reader Module is combined with the RS232 Interface Board. This board provides an asynchronous serial communication interface that can be directly connected to commonly used system controllers or PCs. Features include the following:

- RS232-compatible asynchronous serial port (UART)
- Common Mode noise filter to minimize conducted emissions
- LED for on/off indicator
- ± 15kV ESD-protected transceivers
- EMI filter for RS232 lines
- 9-pin D-sub connector
- On-board null-modem connection
- Data rate up to 38,400 bits per second
  (19,200 bits per second implemented with current firmware)
- Single 12 Volt power-supply connector

The Tag-it Reader Module provides an antenna output that is matched to an impedance of 50 Ohms at 13.56 MHz.

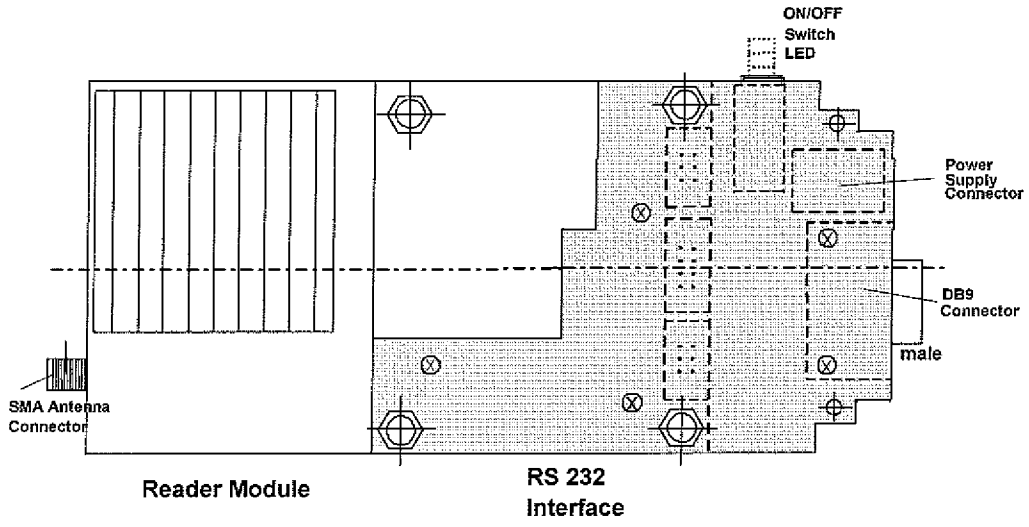
3.3 Reader Module Interfaces

This section defines the interfaces of the Reader Module and the RS232 Interface Board.

The connectors are as follows:

- antenna (SMA) connector
- the power supply connector
- a DB9 male connector

Figure 11: Reader Module (RI-R00-321A) Interfaces



3.3.1 Connectors

Table 5: Reader Board Power (J1) Pin Connections

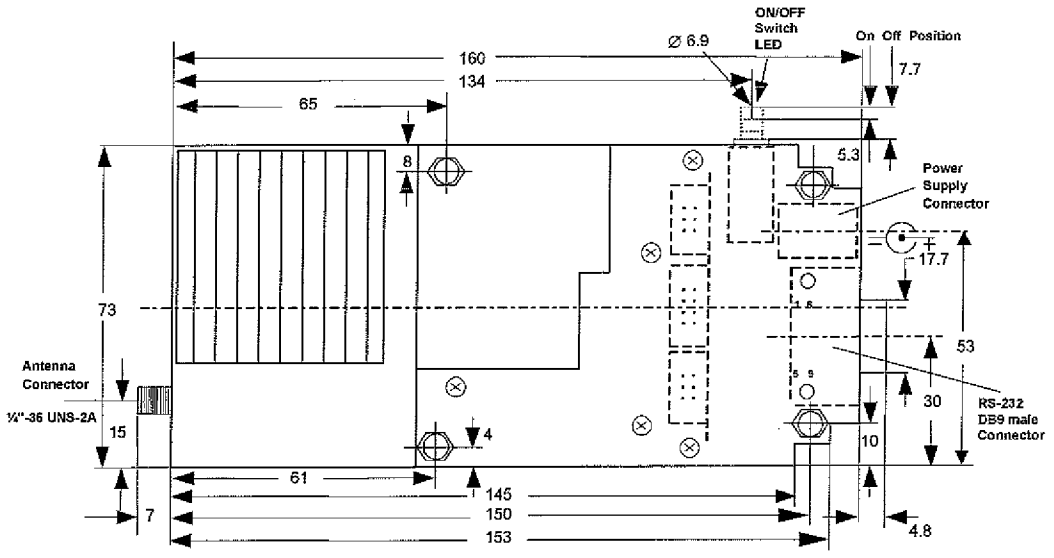
RS232 DB9 Connector (male)		
Pin #	**Connection**	
1	NC	Not connected
2	Transmit data (TX)	Data - reader to host
3	Receive data (RX)	Data - host to reader
4	NC	Not connected
5	Signal ground (GND)	Reference point for signals
6	NC	Not connected
7	NC	Not connected
8	NC	Not connected
9	NC	Not connected

Table 6: RS232 Interface Power Connections

RS232 Power Connector		
	Connection	
Pin	+12 Volt	Input Voltage from Power Supply
	Ground Input (PGND-2)	Power Supply Ground

3.3.2 Dimensions

Figure 12: Reader Module (RI-R00-321A) Dimensions



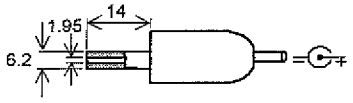
Dimensions in mm
Drawing not to scale
Tolerances: ±1mm

3.4 Installation

3.4.1 What You Will Need

- RS232 cable (1:1 connection) female/female connectors
- Linear regulated 12 V ± 5% Power Supply min. 1.3 A including low voltage connector

Figure 13: Low Voltage Connector



- 1 antenna cable with connector Type RF-SMA (male)
- 2 connectors (female) straight, double row 6-pin (pitch 2.54, height 7 mm)
- 4 screws M3x(XX) (XX = length depends on the wall thickness of the object to mount on)
- Power supply 12 V ± 5%, min. 1.5 A
- PC with RS232 Interface and installed software, for example:
  "Tag-it Navigator" (RI-S00-NAV1)

Recommended for reader tuning:

- Oscilloscope,
  min. 30 MHz, to measure peak-to-peak values at resolutions of 0.1 Vpp
- 50 Ω dummy load (inductive free) for antenna representation
- Tuning screwdriver

Information:

We recommend that you use the Tag-it Navigator™ to control the Tag-it reader.

Tag-it Navigator is a Windows program capable of communication with the Tag-it Commander reader units via a standard serial interface. It supports the Host Protocol implemented in the reader, allowing all supported commands to be executed, for example: writing and reading data to and from Tag-it transponders.

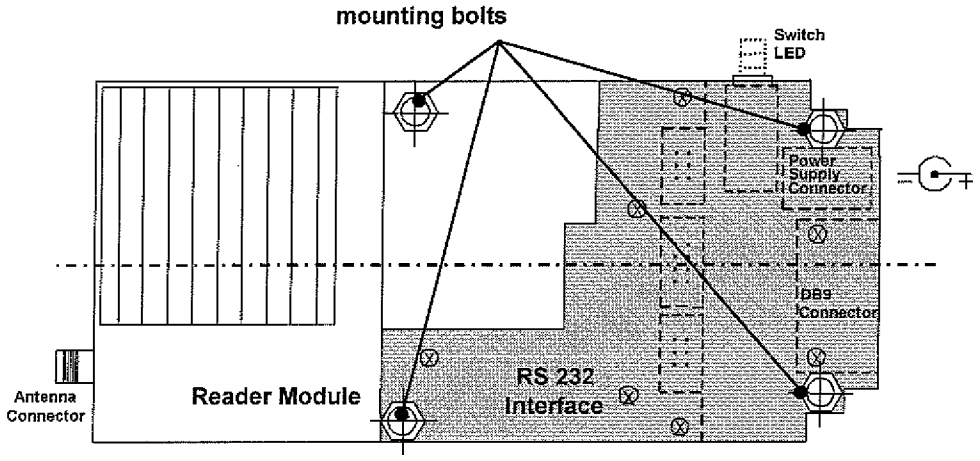
Tag-it Navigator is a tool, which can be used for reader setup, tuning, or diagnosis. Additionally, it can log transponder responses for initial experimentation and testing with the Tag-it System. It provides data and time information, and can display the acquired data in a number of different formats.

The Tag-it Navigator can be obtained from your nearest TIRIS Sales Office, or downloaded from the TIRIS Web Site **http://www.tiris.com**.

3.4.2 Mounting

- Place the Reader Module carefully into or onto the object or housing that has been prepared with holes for the mounting bolts.
- Secure the Reader Module to the object/housing using the four screws for the mounting bolts.

Figure 14: Mounting Bolts (RI-R00-321A)



WARNING:

THE HEAT SINKS OF THE READER MODULE CAN GET HOT (APPROXIMATELY 80°C). THEREFORE, BE CAREFUL NOT TO TOUCH THE HEAT SINKS WHEN THE READER IS TURNED ON. HANDLE THE READER MODULE WITH CARE TO AVOID BEING BURNT.

MAKE SURE YOU HAVE SELECTED PROPER MOUNTING MATERIALS, WHICH WITHSTAND THESE TEMPERATURES.

3.4.3 Attaching Cables

- Connect the data communication cables to connectors J2 and J3.
- Attach the antenna.
- Attach the power supply.

CAUTION:

Make sure the power supply is switched to "OFF" before connecting the power cable.

Connector misalignment can damage the Reader Module.

3.4.4 Transmitter Output Power

The reader output power can be adjusted by potentiometer R3. The location of potentiometer R3 is shown in Figure 15.

Perform the following steps in order to achieve proper hardware and software conditions:

- Connect the 50 Ω dummy load to the SMA antenna connector.
- Switch power at PC and Reader Module to "On".
- Start the software, for example: "Tag-it Navigator".
- Set command "Transmitter" to "On" Continuous Wave (CW).
- Measure peak-to-peak voltage across the dummy load with scope at impedance of 1 MΩ.
- Calculate the transmitted power regarding the following equation:

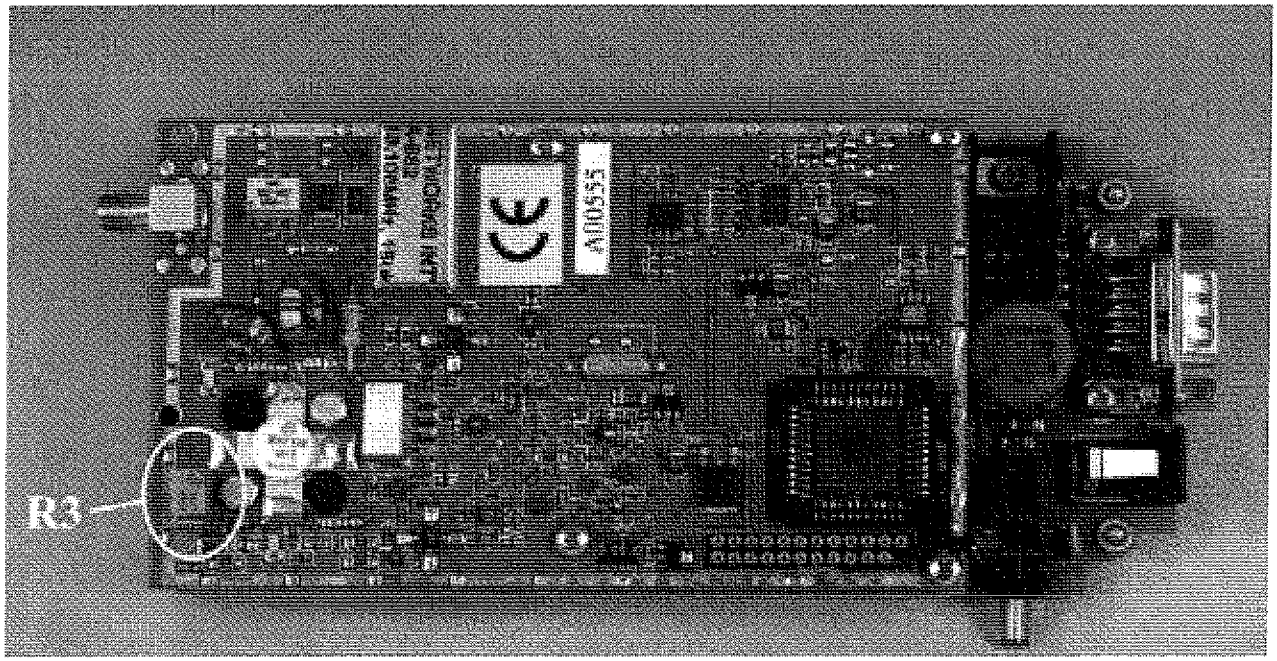
$$P = V^2eff/R \Rightarrow Vpp = 2.82 \sqrt{(P\ 50\Omega)}$$

Table 7 shows some approximate reference values that can be expected.

Table 7: Reference values for tuning the Reader Module (RI-R00-321A)

Voltage (Vpp)	6.30	14.1	19.9
Power in mW	100	500	1000

Figure 15: Location of Potentiometer R3 (RI-R00-321A)



CHAPTER 4

Technical Data

This chapter provides the technical specifications of the Tag-it Reader Modules. It also provides information about packing and storage.

Topic **Page**

4.1 Specification Summary

Electrical Data		
Operating frequency		fc: 13.56 MHz
RF power output		100 mW to 1.1 W adjustable
Power change over operating temperature range		2dB max.
Antenna bandwidth		1 MHz @-3dB
Antenna impedance		50 Ω at 13.56 MHz
Return loss		20dB or better (VSWR<1:1.222)
Maximum antenna cable length		15 meters
Transmitter modulation		Pulse width coded, AM 100%; on-off ratio greater 40dB
Receive frequencies and bit modulation		Manchester coded A = fc ± 423.75 kHz; B = fc ± 484.29 kHz Low bit: transition A to B. High bit: transition B to A.
Receiver sensitivity		Better -60dBm@20dBs/n; bit error rate 10^{-4}
Operating Voltage		12V ± 5%
Current consumption @12V:	Active	850 mA@800 mWatt RF-output
	Stand-by (transmitter off)	650 mA

Control module	
Digital Signal Processor	DSP TMS320F206
Flash EEPROM	32K x 16
S-RAM	4.5K x 16

Communication ports		
	RI-R00-320A	RI-R00-321A
Asynchronous serial port	up to 57,600 bits/s 19,200 bits/s implemented	up to 38,400 bits/s 19,200 bits/s implemented
Expansion port (RI-R00-320A)	for reader synchronization	-

Connectors		
Antenna	SMA socket, 50 Ω, 90° angle	SMA socket, 50 Ω, 90° angle
Power	J1: 6-pin double row header, vertical, pitch 2.54 mm	Low voltage, ØPin 1.9 mm, Ø 6.6 mm, depth 14 mm
	J2: 6-pin double-row header, vertical, pitch 2.54 mm	RS232: 9-pin, male
	J3: 8-pin double-row header, vertical, pitch 2.54 mm	

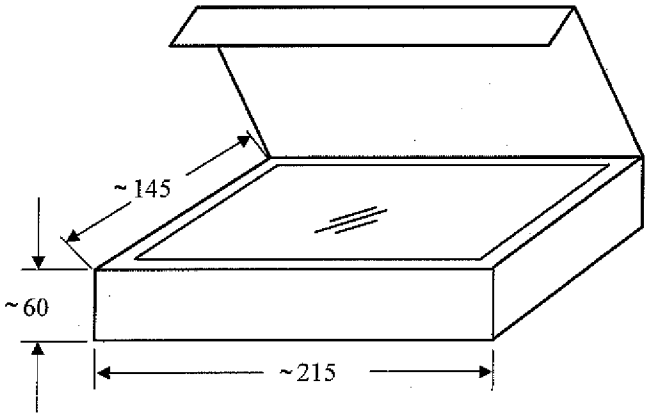
Environmental Data	
Operating temperatures	-20 to +55°C (including self-generated heat)
Storage temperatures	-40 to +80°C
Vibration	Suited for static application

Overall Dimensions (excluding connectors and switch protrusions)		
	126 x 73 x 43 mm (± 1 mm)	160 x 73 x 43 mm (± 1 mm)
Weight	170 g	220 g

4.2 Packing

The Tag-it Reader Modules are shipped in anti-static bags and standard packing boxes. The data provided below should only be viewed as guide values.

Figure 16: Packing



1	**Reader Module 320A** 220 mm x 120 mm x 90 mm Weight: ~ 0.4 kg
2	**Reader Module 321A with RS232 Interface** 220 mm x 120 mm x 90 mm Weight: ~ 0.5 kg

4.3 Storage

The following rules must be applied when storing the Tag-it Reader Modules for long periods:

- Store only in dry rooms.
- Storage temperature is -40°C to +80°C.

CHAPTER 5

Regulatory, Safety and Warranty Notices

This chapter provides important information about regulatory constraints and safety precautions.

Topic **Page**

5.1 Regulatory Notes

An RFID system comprises an RF transmission device, and is therefore subject to national and international regulations.

TI has obtained approvals for this equipment from approval authorities in a number of countries and is continuing to apply for approvals in further countries. Actual status for a given product can be advised by TIRIS Sales Offices.

A system containing these reader boards may be operated only under an experimental license or final approval issued by the relevant approval authority. Before any such device or system can be marketed, an equipment authorization must be obtained form the relevant approval authority.

5.1.1 FCC Notices (U.S.A.)

A demo reader system RI-K01-320A containing Series 6000 Reader Boards (RI-R00-321A) has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. It is the responsibility of the system integrators to get their complete system tested and to obtain approvals from the appropriate local authorities before operating or selling this system.

5.1.2 ETSI Conformity

A demo reader system RI-K02-320A containing Series 6000 Reader Boards (RI-R00-321A) has been tested and found to comply with the European standard EN300330. It is the responsibility of the system integrators to get their complete system tested and to obtain approvals from the appropriate local authorities before operating or selling this system.

5.1.3 CE Conformity

A CE Declaration of Conformity is available for this Tag-it system at TIRIS Sales Offices.

Any device or system incorporating the Tag-it reader system, in full or in part, in any other than the originally tested configuration needs to be verified against the European EMC directive 99/5/EC. A separate Declaration of Conformity must be issued by the System Integrator or user of such a system prior to marketing and operating it in European Community.

5.2 Safety Precautions

5.2.1 Human Safety

A Tag-it system RI-K02-320A (based on reader module RI-R00-321A, adjusted to 800 mW) has been tested against the following standards regarding human safety in electromagnetic fields, including the effect on persons wearing implanted pace makers:

- DIN VDE 0848, part 2
- IEEE / ANSI C95.1-1991

TÜV Product Service has confirmed that the tested system meets the requirements in accordance with these standards.

In case of RI-K02-320A the operator of the system needs to install means that prevent exposure of persons to the antenna field at distances of less than 45 cm. This addresses the unlikely case of impact on old pace makers that have not been produced according to current standards (EN 50061/A1). In other cases, a distance of 20 cm is sufficient.

WARNING:

CUSTOMERS USING THE TAG-IT READER BOARDS ARE RESPONSIBLE FOR OPERATING THEIR SYSTEM UNDER IMPLEMENTED POWER LEVELS AND ANTENNA CONFIGURATIONS AGAINST RELEVANT STANDARDS FOR HUMAN SAFETY IN ELECTRONIC FIELDS. ANY IMPLEMENTATION OF THE SYSTEM THAT VARIES FROM THE TESTED CONFIGURATION (E.G. CHANGES IN ANTENNA SIZE OR POWER OUTPUT) ARE KNOWN TO IMPACT CONFORMANCE AND MUST BE RE-TESTED TO ASSURE SAFETY.

5.2.2 Application Restrictions

CAUTIONS:

These reader boards are designed for integration in application systems for static installation. Prevention of vibration is strongly recommended.

When integrating these boards into housings appropriate means of cooling may be necessary in order to prevent that the combination of environmental temperature and heat generated by the reader board will not exceed the specified operating temperature.

5.2.3 ESD Safety Information

The Reader Module is packed in special anti-static envelopes, which protect against electrostatic charge that could cause damage.

- Handle the Reader Module carefully and keep it in the protective envelope until you are ready to install it.
- Whenever possible, handle the Reader Module by its edges or frame.

5.3 Warranty and Liability

The "General Conditions of Sale and Delivery" of Texas Instruments Incorporated or a TI subsidiary apply. Warranty and liability claims for defect products, injuries to persons and property damages are void if they are the result of one or more of the following causes:

- improper use of the Reader Modules
- unauthorized assembly, operation and maintenance of the Reader Modules
- operation of the Reader Modules with defective and/or non-functioning safety and protective equipment
- failure to observe the instructions during transport, storage, assembly, operation, maintenance and setting up of the Reader Modules
- unauthorized changes to the Reader Modules
- insufficient monitoring of the Reader Modules' operation or environmental conditions
- improperly conducted repairs
- catastrophes caused by foreign bodies and acts of God.

APPENDIX A

Terms & Abbreviations

The terms and abbreviations used in this manual can be found in the TIRIS Terms and Abbreviations Manual - document number 11-03-21-002. This manual can be found via our home page:

http://www.tiris.com

X. RELATED PROCEEDINGS APPENDIX

None.